



BULLETIN No. 31.

DEPARTMENT OF AGRICULTURE

—OF—

BRITISH COLUMBIA.

FOUL BROOD AMONG BEES.

DEPARTMENT OF AGRICULTURE.

VICTORIA, B. C., March 20th, 1911.

Honourable Price Ellison,

Minister of Agriculture,

SIR,—I have the honour to submit herewith a treatise on "Foul Brood among Bees," compiled by Mr. L. Harris, of Vernon. This bulletin will enable the bee-keeper to detect this most fatal disease when it occurs, and show the right methods to be adopted for its eradication.

I have the honour to be,

Sir,

Your obedient servant,

WM. E. SCOTT.

Deputy Minister of Agriculture.

FOUL BROOD.

By L. HARRIS.

DESCRIPTION OF DISEASE.

BEES in their natural state are subject to few diseases of a serious nature, with one exception, that of foul brood. This disease is one which affects the young of the honey-bee, and is in the nature of "bacteria." Its scientific name is *Bacillus alvei*, signifying "small sticks," or living organisms resembling small sticks. The disease does not appear to affect the mature bees materially, except that they do not seem to have the energy of bees in healthy hives. This is due, mainly, to the uncongenial condition of the hive, and they are discouraged. Yet, if they are given a clean start and stimulated, they will become as energetic and will do as good work as any.

The disease as it will first be seen by the bee-keeper will appear amongst the unsealed or white healthy brood; a larva here and there may be seen of a yellowish colour, sometimes with a grey spot. These in time will turn brown, and finally settle down to the lowest side of the cell.

It is very probable the disease will not be detected until the brood is sealed over, when the cappings of the diseased cells will present a sunken appearance, making them appear darker in colour than the surrounding healthy cells, which are nearly always more or less convex. The dark or concave diseased cells will often be punctured with tiny ragged holes. These small holes are made by the mature bees, who know these cells are overdue to hatch, and they have been investigating to find the reason why they have not hatched on time. But so soon as they have made this tiny opening the offensive odour from the dead larvæ appears to be more than their delicate and refined sense of smell can endure, and so these cells are left further undisturbed for an indefinite time. If the cappings of these diseased cells are removed, we shall find the young larvæ in a decayed or decaying state, and will be of a brown coffee colour or grey, varying from light brown to almost black. Some of the dead larvæ sometimes dry up *before* they get to the wet, "ropy" condition. These the bees are able to remove from the cells on account of their being so dry; they do not adhere to the sides of the cells as do those that are "ropy," and which the bees seem unable to remove; others become so *plastic* that they are not removed. The two chief characteristics of the disease are its "ropiness" and the very offensive odour given off by the disease in an advanced stage. It is in this stage that the smell can *always* be detected.

It will not be well to depend on the smell alone for the first indications of the disease, though one experienced in the disease can often detect it even though there may be only a few cells pointing to the disease. A surer test (in its earliest stages) than the smell is to insert a small pointed stick and remove this dead matter, when, if it is foul brood, it will leave the cells in strings, anywhere in length from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches or more, and it is with difficulty that this gluey, "ropy" matter can be removed from the cell entirely.

Bees affected with foul brood often spread themselves over the combs; they separate themselves as soon as the hive is opened. They do not sit so closely over their brood as do the bees in healthy hives.

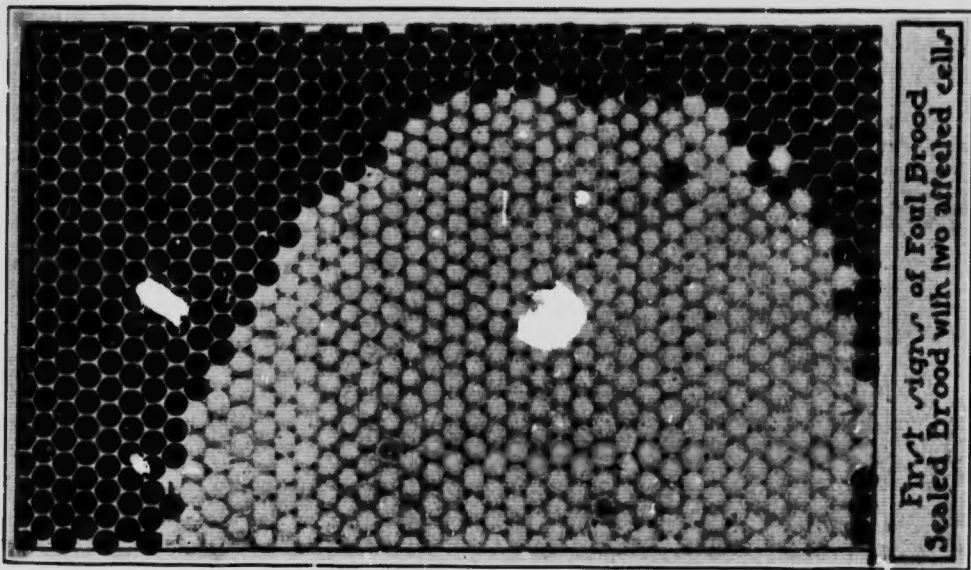
It is not while in this wet and "ropy" condition that the danger of infection lies, but rather in the dried state following this condition. These dried or semi-dried larvae are capable of producing spores, or a fungoid growth, which growth will in turn produce spores again to be carried by the bees and in other ways, thus spreading the disease to other hives, and possibly to other apiaries. The disease begins its work of destruction internally in the bodies of the young bees, and very soon shows its work externally by first causing a small dark spot. As mentioned previously, the larvae soon die, turn yellow, then brown, and some black. The disease always attacks the young embryo that are from four or five days to eight or ten days old. After the young bees have assumed the hard or shelly stage, they appear better able to resist the disease, as it is seldom the disease destroys the young that are over twelve or fourteen days old, or that have acquired even the rudiments of legs and wings.

CAUSE OF FOUL BROOD.

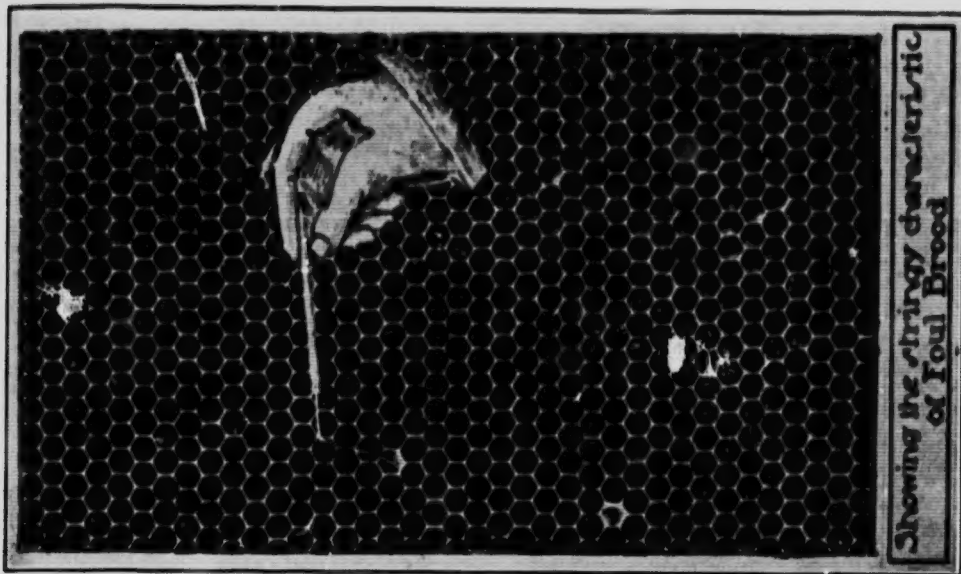
We read a good deal in the bee papers about foul brood, but very little is said about how the disease is first caused. Of course, it is well known that one colony may contract it from a diseased colony; but how does it come into a district or an apiary where there are no other bees kept within several miles? Is it not reasonable to suppose that the germs of foul brood are ever present, just the same as the germs of typhoid and other diseases, and ever ready for any favourable opportunity to get in their deadly work?

It has been my experience, extending over many years in England, to handle hundreds of the old-fashioned straw skeps, as kept by the average bee-keeper thirty or forty years ago, and who never interfered with their bees from year to year, and in my experience I never met with a case of foul brood when bees were kept in this way. Little was known generally in England at that time about scientific bee-keeping; most of the poor bees were suffocated to obtain the honey, and the average bee-keeper would willingly give the bees to any one who would take the honey from them without destroying the bees. In this way I commenced bee-keeping something like thirty-five years ago, by uniting these driven bees and feeding them with sugar-syrup, and thus I obtained some of the finest colonies I ever had.

By accident we got hold of a copy of the *British Bee-Journal*, then edited and published by Abbott Bros., Southall. This was the first time I had ever heard of bar-framed hives, or that honey could be obtained from the hives without destroying the bees. Anyhow, I determined I would keep bees on the more humane principle, and making a hive commenced bee-keeping, and became very enthusiastic, giving them constant attention. My father had been a bee-keeper before I can remember, but didn't know much about them; he had never heard of foul brood, but had seen enough of the young embryo when taking the honey in the old-fashioned way to know that the young brood of bees was very delicate and tender. He reasoned that they could not stand exposure or any great variation of temperature, and he told me I should have trouble with my bees if I was not very careful, and if the brood was exposed too long. He was right; the trouble came along and lots



First signs of Foul Brood
Sealed Brood with two affected cells



Showing the stringy characteristic
of Foul Brood

of it, too. I got foul brood among my bees in less than twelve months from the time I started; and though I spent a lot of money in chemicals, nebulators, spraying outfits, etc., to try and effect a cure, to say nothing of the time lost, I never entirely got rid of the disease for years.

It is not to be inferred that chilled brood always leads to foul brood; but I firmly believe it provides a suitable medium for the germs of the disease to get in their work, because, as with complaints peculiar to children, if a child is out of sorts or otherwise run down, that child is more susceptible to disease than one in good health. So with young bees; they get chilled, are out of sorts, the mature bees feed them with food containing the germs of the disease; the young bees are already chilled and feeling sickly, and so are not able to resist the effects of these germs and succumb. When once the disease is established it does not matter whether there is chilled brood or healthy, it will spread with remarkable rapidity.

Of course, it goes without saying that bees cannot be kept on a profit basis by a let-alone principle; they *must* have the proper and necessary attention if they are to be made a success from a financial standpoint. At the same time, great care should always be exercised when handling, so as not to expose the brood unnecessarily long, or at too low a temperature.

REMEDIES.

The surest and simplest way to arrest the disease would be to completely destroy the hive, bees, and all accessories by fire. Perhaps a more humane way would be to shake or brush all the bees from the infected colony into an empty box, confine them for seventy-five or eighty hours, shade the entrance, or put them into a cellar. In the meantime prepare a proper hive, fit it with frames of foundation "full sheets," as many as the bees can fully occupy. After the bees have been confined seventy-five or eighty hours, put them into the clean hive; and if a young fertile queen can be given, after removing the old one, the cure will be complete.

The whole of the infected combs should be destroyed with fire, the hive disinfected by either burning out with sulphur or thoroughly washed out with carbolic acid, then stood out in the open until the smell of the disinfectants has entirely passed off, when it can be used when required. The colony under treatment should be fed with sugar-syrup, a quart every day, until it has become populous, and has sufficient stores for wintering.



CHAPTER 18.

An Act for the Suppression of Foul Brood among Bees.

[1st March, 1911.]

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows:—

1. This Act may be cited as the "Foul Brood Act, 1911."

2. (1.) The word "Minister," whenever used in this Act, shall mean the Minister of Finance and Agriculture for the Province of British Columbia.

(2.) The word "Inspector" shall mean Inspector of Apiaries for the Province of British Columbia.

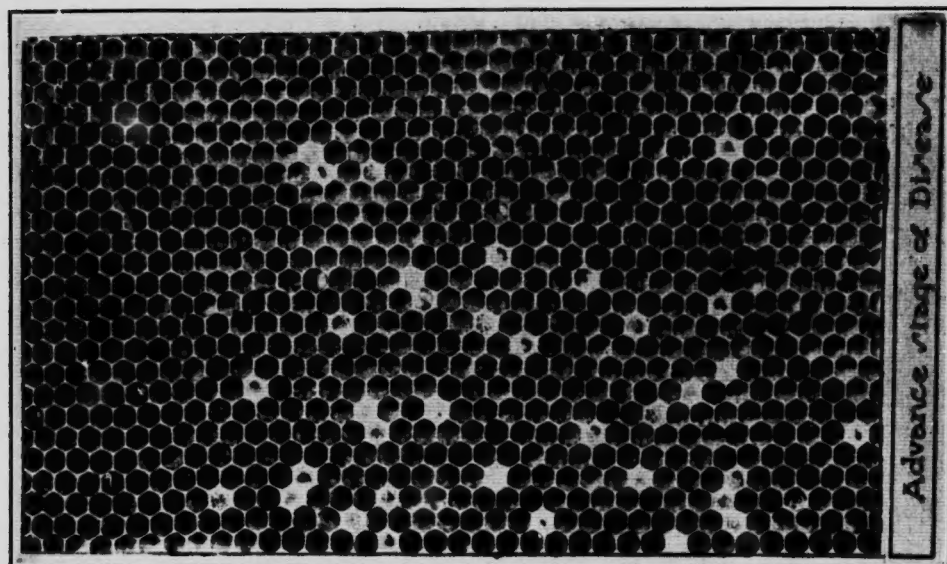
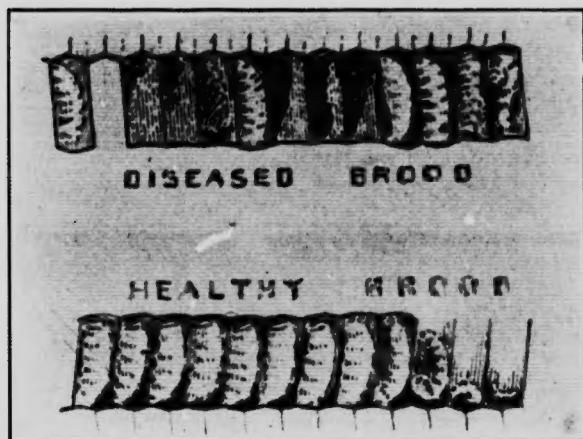
3. The Lieutenant-Governor in Council may from time to time appoint such person or persons as he shall think proper to act as Inspector or Inspectors to carry out the provisions of this Act, and such Inspectors shall be under the direction and control of the Minister.

4. (1.) The said Inspector shall, whenever so directed by the Minister, visit without unnecessary delay any locality in the Province of British Columbia and there examine such apiary or apiaries as the said Minister may direct, and ascertain whether or not the diseases known as "foul brood" or "black brood," or either of them, exist in such apiary or apiaries, or in their vicinity.

(2.) Wherever the said Inspector is satisfied of the existence of such disease in its virulent or malignant type, he shall order all colonies so affected, together with the hives occupied by them, and the contents of such hives and all tainted appurtenances or appliances that cannot be disinfected, to be immediately destroyed by fire under his personal direction and superintendence, and in such manner as may be necessary to prevent the spread of the said disease, and to thoroughly disinfect any appurtenances or appliances capable of being disinfected.

(3.) Where the Inspector, who shall be the sole judge thereof, is satisfied that the disease exists, but only in milder types and in its incipient stages, and is being or may be treated successfully, and has reason to believe that it may be entirely cured and eradicated, then the Inspector may omit to destroy or order the destruction of the colonies and hives in which such disease exists, but shall give the owner or caretaker of the diseased apiary or apiaries full instructions how to treat said cases. The Minister shall cause said apiary or apiaries to be visited from time to time, as he may deem best, and if after proper treatment the said bees shall not be cured of the disease, then he may cause the same, with the hives and all tainted appurtenances and appliances, to be destroyed as in the preceding subsection hereof provided.

(4.) After inspecting infected hives or fixtures or handling diseased bees, the Inspector shall, before leaving the premises, or inspecting any other colony of bees or proceeding to any other apiary, thoroughly disinfect his own person and clothing, and shall see that every assistant with him also thoroughly disinfects his person and clothing.



5. The Inspector shall have full power, in his discretion, to order any owner or possessor of bees dwelling in box hives (being mere boxes without frames) to transfer such bees to movable frame hives within a specified time; and in default of such transfer, the Inspector may destroy or order the destruction of such box hives and the bees dwelling therein, or may himself cause such bees to be so transferred.

6. Any owner or caretaker of diseased colonies of bees, or of any affected appliances, who knowingly sells, or barter, or gives away such diseased colonies or any bees, comb, or honey therefrom, or any infected appliances, shall, on conviction thereof before any Justice of the Peace, be liable to a fine of not less than fifty dollars and not more than one hundred dollars, or to imprisonment for any term not exceeding two months.

7. Any person whose bees have been destroyed, or are being or have been treated for foul brood or black brood, who sells or offers for sale any honey-comb, honey, bees, hives, appurtenances, or appliances of any kind after such destruction or treatment, and before being authorised by the Inspector so to do, or who knowingly exposes in his bee-yard or elsewhere any infected comb, honey, or other infected thing, or conceals the fact that said disease exists among his bees, shall, on conviction before a Justice of the Peace, be liable to a fine of not less than twenty dollars and not more than fifty dollars, or to imprisonment for a term not exceeding two months and not less than one month, or both such fine and imprisonment.

8. Any owner or caretaker of bees who refuses to allow the Inspector or his assistant or assistants to freely examine his bees or the premises in which they are kept, or who refuses to destroy the infected bees and appurtenances or to permit them to be destroyed, or who refuses to transfer bees dwelling in box hives to movable frame hives, when so directed by the Inspector, shall, on conviction before a Justice of the Peace, be liable to a fine of not less than twenty-five dollars and not more than fifty dollars for the first offence, and not less than fifty dollars and not more than one hundred dollars for the second or any subsequent offence, and the said Justice of the Peace shall make an order directing the said owner or possessor forthwith to carry out the direction of the Inspector.

9. When an owner or caretaker of bees disobeys the directions of the said Inspector, or offers resistance to or obstructs the said Inspector in the performance of his duties, a Justice of the Peace shall, upon the demand of the said Inspector, cause a sufficient number of special constables to be sworn in, and such special constables shall, under the direction of the Inspector, proceed to the premises of such owner or caretaker and assist the Inspector to seize all the diseased colonies and infected appurtenances and appliances and burn them forthwith; and if necessary the said Inspector or constables may arrest the said owner or caretaker and bring him before a Justice of the Peace, to be dealt with according to the provisions of the preceding section of this Act.

10. Every bee-keeper or other person who is aware of the existence of foul brood or black brood, either in his own apiary or elsewhere, shall immediately notify the Minister of the existence of such disease, and in default of so doing shall, on summary conviction before a Justice of the Peace, be liable to a fine of not less than five dollars nor more than twenty-five dollars and costs for each such offence.

11. Upon receiving the notice mentioned in the preceding section, or in any way becoming aware of the existence of foul brood in any locality, the said Minister may direct the said Inspector to immediately proceed to and inspect

the infected premises; but where the person giving such notice is unknown to the Minister, or there is reason to believe that the information in said notice is untrustworthy, or that the person giving such notice is actuated by improper motives, then the Minister may require the person giving such notice to deposit with him such sum as the Minister may decide, not exceeding ten dollars, as a guarantee of good faith, before the said notice is acted upon, and if it proves that said notice was properly given, then the said deposit shall be returned to the person giving such notice, but otherwise the said deposit shall be forfeited.

12. The Minister shall have power to order into quarantine at the point of entry into the Province of British Columbia, or such other place as he may appoint, for a period of not more than nine months, and if found to be infected may order to be destroyed, any or all bees imported into the Province of British Columbia; also to order the disinfection of all bee appliances that have been in use, and to order the destruction by fire of all combs and frames in empty hives.

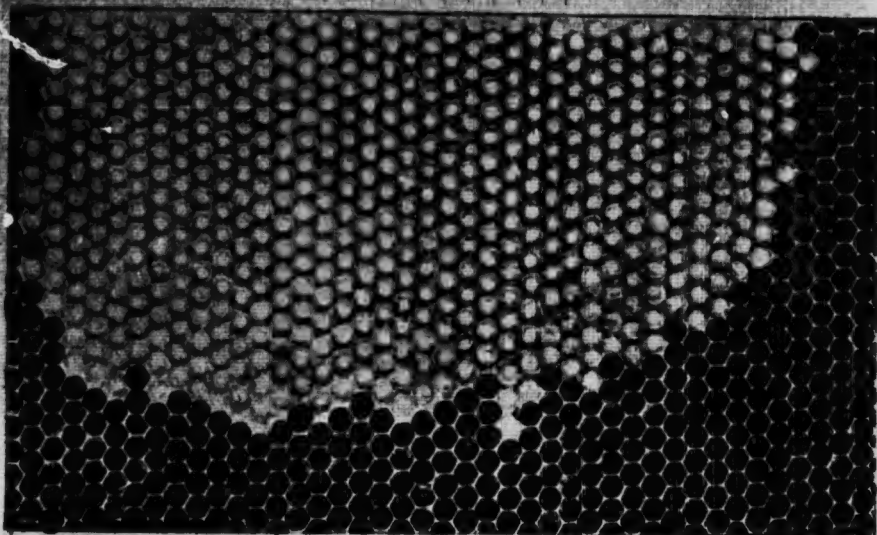
13. The Inspectors appointed under the provisions of this Act shall be paid such salary or remuneration as the Minister may from time to time determine.

14. The Minister may from time to time, subject to the approval of the Lieutenant-Governor in Council, make rules and regulations for carrying out the purposes of this Act.

HEALTHY BROOD



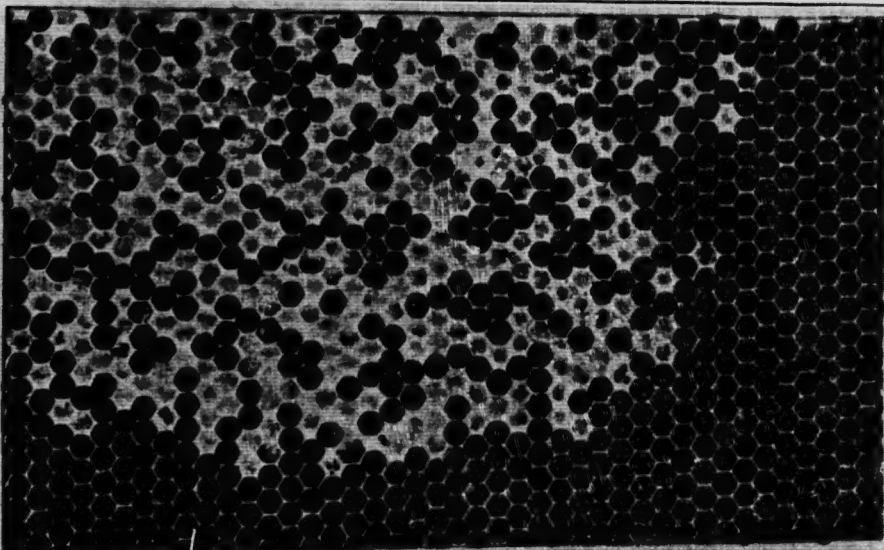
Unclipped or Baldheaded Brood
Sometimes mistaken for Foul Brood



Worst stage of Disease



DISEASED BROOD



**BULLETINS AVAILABLE FOR DISTRIBUTION BY THE DEPARTMENT
OF AGRICULTURE.**

-
- No. 7.—Flax.
 .. 8.—Feeding Farm Animals.
 .. 11.—Wild Mustard.
 .. 12.—Information for Fruit-growers.
 .. 15.—Cut-worms.
 .. 20.—Varieties of Fruit Recommended.
 .. 21.—Strawberry Growing.
 .. 22.—Care and Management of Orchards.
 .. 24.—Farmers' Foes and Friends.
 .. 25.—Orchard Cleansing.
 .. 26.—Practical Poultry-raising (revised edition).
 .. 28.—The Production of Eggs.
 .. 29.—Poultry Industry on the Pacific Coast.
 .. 30.—Guide to Bee-keeping in British Columbia.
 .. 31.—Foul Brood among Bees.
 .. 32.—The Control of Bovine Tuberculosis in British Columbia.

Applications for bulletins should be addressed to the Secretary, Department of Agriculture, Victoria, B. C.

VICTORIA, B. C. :

Printed by RICHARD WOLFENDEN, L.S.O., V.D., Printer to the King's Most Excellent Majesty.
 1911.